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NEW PSEUDOCOCCIDS FROM MAURITIUS (HOMOPTERA, COCCOIDEA)

By Raymond Mamet.
(*Rose Hill, Mauritius.*)

Pedrococcus gen. n.

Referable to the Pseudococcidae and characterised by the following definition :—

Adult female oval, not enclosed in a sac and not producing an ovisac. Antennae 7- to 8-jointed, 8-jointed in genotype; terminal joint elongate and longest. Mouth-parts well developed; mentum dimerous. Limbs stout; claws of legs without denticle. Body with stout conical spines on both dorsum and margin; these spines are situated on well-demarcated and faintly sclerotised prominences and are accompanied by a few trilocular pores (3–5 in genotype); they are scattered over the frontal and thoracic segments and placed in one row on dorsum of each abdominal segment. Dorsal dermis with numerous trilocular pores and short setae; ventral dermis with numerous trilocular pores, slender setae and few large discoid pores which are confined to the vulvar region. No true cerarii present. Anal ring normal, with two rows of beads and six setae. Anterior and posterior dorsal ostioles present.

Genotype : *Pedronia greeni* Mamet (1937).

Near to *Pedronia* Green but differs from it in having the dorsal conical spines situated on conspicuous sclerotised prominences and accompanied by trilocular pores.

Pedrococcus greeni (Mamet).

1937, *Pedronia greeni* Mamet, *Proc. R. ent. Soc. Lond.* (B) **6** : 173, fig. 1.

Re-description.

Adult female (fig. 1, *a*) (in 70% alcohol) oval in outline, somewhat convex, brownish to dark brown, coated with a white powdery secretion. Abdominal segments distinctly indicated, not produced laterally. Antennae 8-jointed (fig. 1, *b*); all the joints with several longish slender setae; terminal joint elongate and longest. Formula : 8, 2, 1, (3, 7), 5, (4, 6). Distance between antennal bases approximately equal to $\frac{3}{4}$ length of antenna. Eyes distinct, fairly prominent, submarginal. Mouth-parts fairly developed; mentum dimerous; rostral loop long, extending up to the insertion of the third pair of legs. Anterior and posterior spiracles normal, without parastigmatic pores. Limbs (fig. 1, *c*) well developed and stout; each segment furnished with several longish slender setae. Tarsus (of hind leg) shorter than tibia, being about $\frac{1}{2}$ its length, whilst tibia is slightly shorter than femur. Tibia + tarsus nearly equal in length to femur + trochanter. Tibia with a pair of stout spur-like setae at the distal extremity of inner side and with fairly numerous translucent pores. Femur with very few similar pores. Claw falcate, acute, without denticle. Ungual and tarsal digitules with knobbed extremities; ungual digitules nearly equal in length to claw but distinctly shorter than tarsal digitules. Paranal lobes (fig. 1, *d*) broadly rounded and fairly sclerotised on both dorsal and ventral surfaces. Each lobe furnished dorsally with a pair of stout conical spines (fig. 1, *e*), four short and stout setae and a few trilocular pores which are not concentrated around the spines; ventrally there is a long seta, the paranal lobe seta, arising from below the apex and accompanied by 7–8 auxiliary setae of which the one situated on the inner side of the lobe is distinctly longer than the others but very much shorter than the paranal lobe seta. Anal ring with six setae and the usual double row of beads of the ordinary types. The anal ring setae are shorter than the anal lobe seta, being about $\frac{3}{4}$ its length. There are no true cerarii but a marginal series of 15

groups of 2–3 stout conical spines on each side of the body. Dorsal dermis with trilocular pores, sparsely distributed stout and short setae and numerous stout conical spines, arranged as in fig. 1, *a*. These spines are situated on fairly sclerotised prominences, especially in the median and marginal series and have their bases equal to approximately $\frac{1}{2}$ their length. Each spine is accompanied by 3–5 trilocular pores. Those of the median (fig. 1, *f*) and marginal series are distinctly stouter and longer than the others, especially in the abdominal

FIG. 1.—*Pedrococcus greeni* (Mamet).—Adult female: *a*, adult female showing arrangement of dorsal conical spines; *b*, antenna; *c*, hind leg; *d*, posterior extremity; *e*, anal lobe spines; *f*, dorsal abdominal spines from the median series; *g*, scar left when spines of the median series of dorsal abdominal antepenultimate segment are removed; *h*, types of spines from cephalic area.

region; those of the frontal and thoracic regions vary considerably in size (fig. 1, *h*). Ventral dermis with trilocular pores which seem to be more numerous than on the dorsal dermis; a few large discoid pores are situated in the vulvar region. Ventral setae longer, more slender and more numerous than on the dorsum, especially in the frontal region, where they are longer than anywhere else on the venter. Posterior dorsal ostioles larger than anterior dorsal ostioles; both with tumid lips. Ventral ostiole not found.

Length, 1·9–2·3 mm.; breadth, 1·1–1·2 mm.

Material examined.—The type and three other adult females.

Hosts and localities.—The type was collected on an indigenous orchid, probably a species of *Bulbophyllum*. MAURITIUS: Les Mares (2200 ft.), 1935; other collections on indigenous plants; Cocotte Mt. (2350 ft.), 27.xi.1938; Les Mares (2200 ft.), an adult female, ex type material (1935).

Pedrococcus mauritianus (Mamet).

1939, *Pedronia mauritiana* Mamet, *Bull. Soc. Linn. Lyon* **8**: 215, figs. 1–7.

Re-description.

Adult female (fig. 2, *d*) oval in outline, somewhat convex, yellowish in colour, coated with a white powdery secretion. Antennae (fig. 2, *a*) short and stout, 7-jointed; all the joints with several longish slender setae, 6th and 7th joints with one and two stouter setae respectively, terminal joint elongate and longest. Formula: 7, (1, 2), 4, 6, (3, 5). Distance between antennal bases approximately equal to ½ length of antenna. Eyes distinct, fairly prominent, submarginal. Mouth-parts fairly developed; mentum dimerous. Rostral loop long, extending beyond the insertion of the third pair of legs. Anterior and posterior spiracles normal, without parastigmatic pores. Limbs (fig. 2, *b*) short and stout; each segment with several longish slender setae. Tarsus (of hind leg) shorter than tibia, being a little longer than ½ its length, whilst tibia is slightly shorter than femur. Tibia + tarsus nearly equal in length to femur + trochanter. Tibia with a pair of stout spur-like setae at distal extremity of inner side and with a few translucent pores. Femur with fewer similar pores. Claw falcate, acute, without denticle. Ungual and tarsal digitules with knobbed extremities; ungual digitules a little longer than claw and nearly equal in length to tarsal digitules. Paranal lobes (fig. 2, *c*) broadly rounded and very slightly sclerotised; each lobe furnished dorsally with a pair of stout conical spines situated below the apex, four short setae and a few trilocular pores which are not concentrated around the spines; ventrally there is a long seta, the paranal lobe seta, arising from the apex and accompanied by 5 auxiliary setae of which one is distinctly longer than the others but much shorter than the paranal lobe seta. Anal ring with six setae and a double row of beads of the ordinary types. Anal ring setae shorter than anal lobe seta, being about two-fifths its length. There are no true cerarii but a marginal series of 13 groups of paired stout conical spines on each side of body. Dorsal dermis with trilocular pores, sparsely distributed stout and short setae and numerous stout conical spines arranged as in fig. 2, *d*. These spines are situated on faintly sclerotised prominences, especially in the median and marginal series, and have their bases equal to approximately ½–⅓ their length. Each spine is accompanied by 1–6 trilocular pores. Those of the median and marginal series are in pairs and are distinctly stouter and longer than the others, especially in the abdominal region; those of the thoracic and frontal regions vary considerably in size. Ventral dermis with trilocular pores and a few large discoid pores situated in the vulvar region. Ventral setae longer and more slender than those of dorsum, those of frontal area much longer than anywhere else on the venter. Dorsal ostioles not well developed. Ventral ostiole not found.

Length, 1·3–1·4 mm.; breadth, 0·9 mm.

Material examined.—The type and the paratype.

Host and locality.—The type and the paratype were collected on roots of *Pilea balfouri*. Mauritius: Cocotte Mt. (2350 ft.), 27.xi.1938.

Remarks.—This species is near to *P. greeni*, from which it differs by the stouter and shorter limbs and antennae, the 7-jointed antenna, the smaller number of conical spines in the groups situated on the margin of the body and the smaller number of marginal groups.

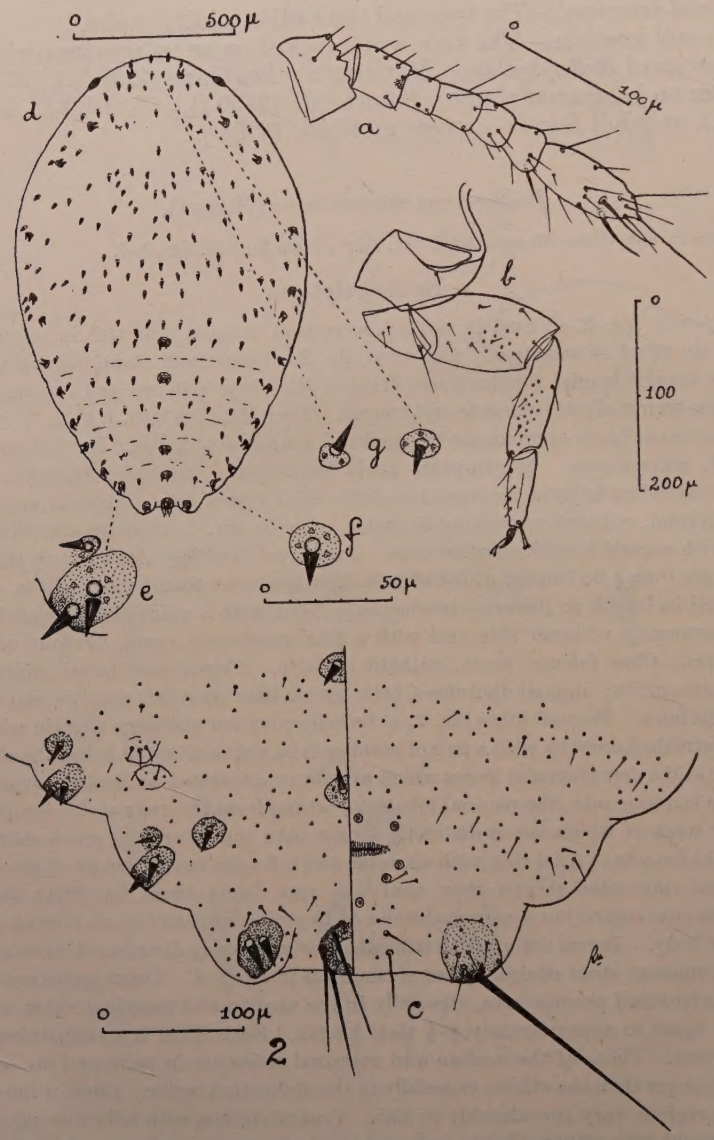

Fig. 2.—*Pedrococcus mauritianus* (Mamet).—Adult female: *a*, antenna; *b*, hind leg; *c*, posterior extremity; *d*, adult female showing arrangement of dorsal conical spines; *e*, spines from penultimate marginal group; *f*, spine from penultimate abdominal segment; *g*, spines from cephalic area.

Pedrococcus longipes sp. n.

Adult female (fig. 3, *d*) (in 70% alcohol) oval in outline, greyish, fairly convex. Antennae slender, 8-jointed (fig. 3, *a*), all the joints with several slender, longish setae; terminal joint elongate and longest. Formula: 8, (1, 2), (3, 5, 7), 6, 4. Distance between antennal bases approximately equal to $\frac{3}{4}$ length of antenna. Eyes small, submarginal. Mouth-parts fairly developed; mentum dimerous; rostral loop extending beyond insertion of second pair of legs. Anterior and posterior spiracles normal, without parastigmatic pores. Limbs (fig. 3, *b*) well developed, slender and long; each segment with several longish slender setae. Tarsus (of hind leg) shorter than tibia, being about two-fifths its length,

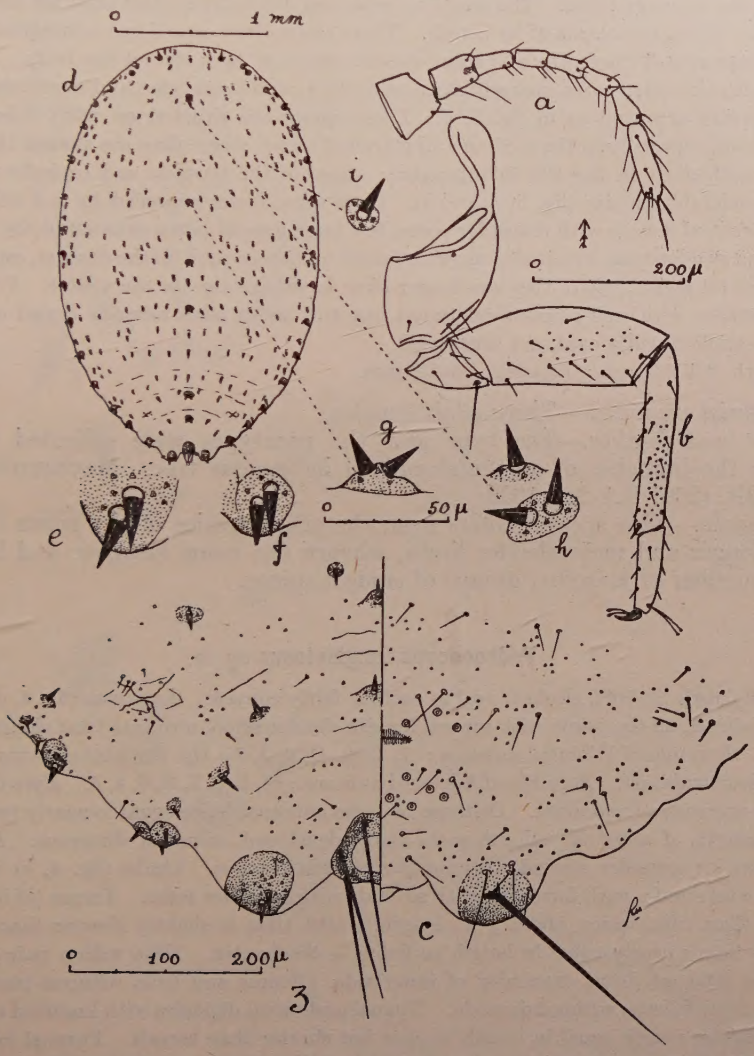

FIG. 3.—*Pedrococcus longipes* sp. n.—Adult female: *a*, antenna; *b*, hind leg; *c*, posterior extremity; *d*, adult female showing arrangement of dorsal conical spines; *e*, anal lobe spines; *f*, spines from marginal group of penultimate abdominal segment; *g*, spines from mesothoracic region; *h* and *i*, spines from prothoracic region.

whilst tibia is slightly shorter than femur. Tibia + tarsus nearly equal in length to femur + trochanter. Tibia with a pair of stout spur-like setae at the distal extremity of inner side and with a few translucent pores. Femur with very few similar pores. Claw falcate, without denticle. Ungual and tarsal digitules with knobbed extremities; ungual digitules a little longer than claw but shorter than tarsal digitules. Paranal lobes (fig. 3, *c*) broadly rounded and fairly sclerotised on both dorsal and ventral surfaces; each furnished dorsally with a pair of stout conical spines (fig. 3, *e*), two short setae and trilocular pores which tend to be concentrated around the spines; ventrally each lobe bears a long seta, the paranal lobe seta, arising from below the apex and accompanied by 4 auxiliary setae, of which one is distinctly longer than the others. Anal ring with six setae and the usual double row of beads of the ordinary types. The anal ring setae are distinctly shorter than the anal lobe seta, being about two-thirds of its length. There are no true cerarii but a marginal series of 17 groups of 2–3 (more often 2) stout conical spines on each side of the body. Dorsal dermis with trilocular pores, sparsely distributed short and stout setae and numerous stout conical spines arranged as in fig. 3, *d*. These spines are situated on fairly sclerotised prominences, especially in the median and marginal series, where they are stouter than the others, particularly in the abdominal region; those of the thoracic and cephalic regions vary considerably in size (fig. 3, *h* and *i*). Each spine is accompanied by 2–6 trilocular pores. Ventral dermis with trilocular pores, few large discoid pores situated in the vulvar region and slender setae which are longer and more numerous than on the dorsum, especially in the frontal region, where they are longer than anywhere else on the venter. Posterior dorsal ostioles with well-pronounced tumid lips and larger than anterior dorsal ostioles. Ventral ostiole broadly oval, not sclerotised.

Length, 2·3–2·7 mm.; breadth, 1·6–1·8 mm.

Material examined.—Three adult females.

Host and locality.—The type and the paratypes were collected whilst beating the branches of an undetermined indigenous tree. MAURITIUS: Le Pouce Mt. (2661 ft.), 2.xi.1939.

Remarks.—This species differs from the other species of the genus by the much longer and more slender limbs, whence the name *longipes*, and by the larger number of marginal groups of conical spines.

Pedrococcus longisetosus sp. n.

Adult female (in 70% alcohol) oval in outline, fairly convex. Antennae (fig. 4, *a* and *b*) 7- to 8-jointed, all the joints with several longish slender setae, terminal joint elongate and longest. Formula of 7-jointed antenna: 7, 1, (2, 4), 6, 3, 5; the 4th joint showing a trace of pseudoarticulation. Formula of 8-jointed antenna: 8, 2, 1, 7, 3, 6, 4, 5. Eyes distinct, fairly prominent, submarginal. Distance between antennal bases equal to nearly two-fifths of the length of antenna. Mouth-parts fairly developed, mentum dimerous. Anterior and posterior spiracles normal, without parastigmatic pores. Limbs (fig. 4, *c*) well developed and stout; each furnished with several longish slender setae. Tarsus (of hind leg) shorter than tibia, being about $\frac{1}{2}$ its length, whilst tibia is slightly shorter than femur. Tibia + tarsus nearly equal in length to femur + trochanter. Tibia with a pair of stout spur-like setae at distal extremity of inner side. Femur and tibia without translucent pores. Claw falcate, without denticle. Ungual and tarsal digitules with knobbed extremities; unguals nearly equal in length to claw but shorter than tarsals. Paranal lobes (fig. 4, *d*) fairly prominent and fairly sclerotised on both dorsal and ventral surfaces; each lobe furnished dorsally with a pair of conical spines, six short and stout setae and a few trilocular pores which are not concentrated around the spines; ventrally, with a long seta, the paranal lobe seta, arising from the apex and accompanied by six auxiliary setae of which

the one situated on the inner side of the lobe is distinctly longer than the others but much shorter than the paranal lobe seta, very few trilocular pores are also present. Anal ring with six setae and the usual double row of beads of the ordinary types. Anal ring setae shorter than paranal lobe seta, being about two-thirds its length. There are no true cerarii

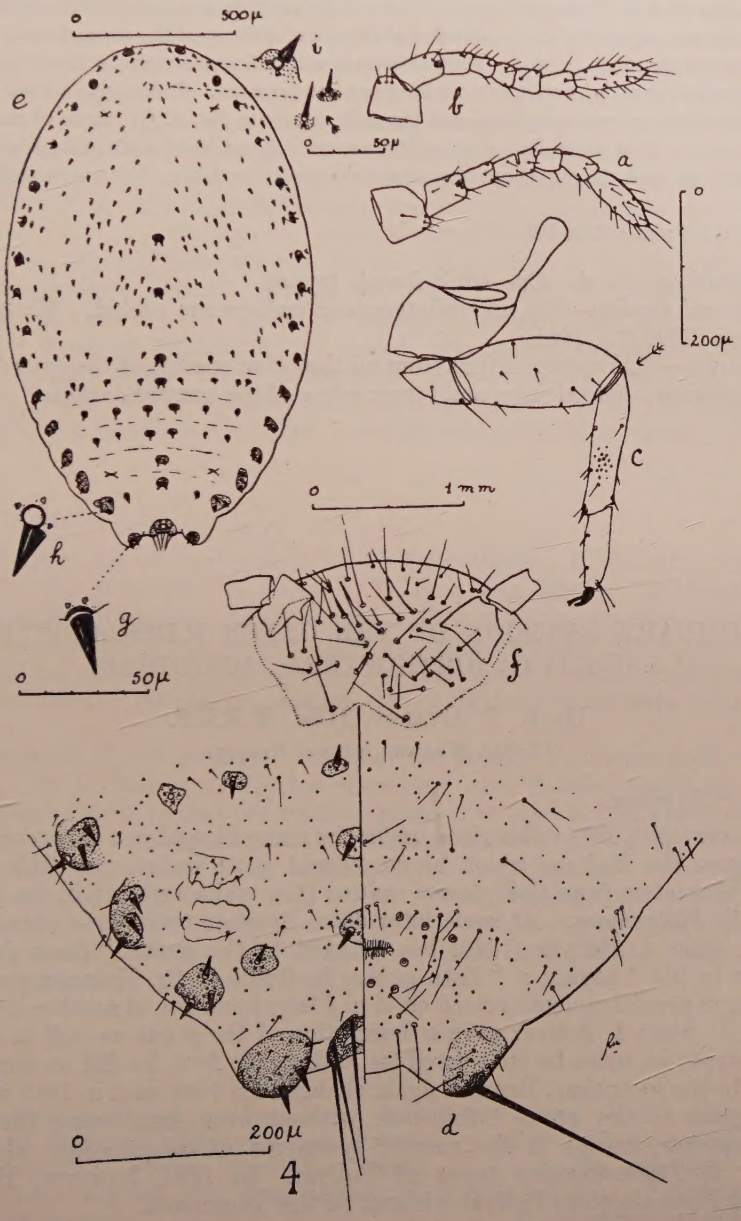

FIG. 4.—*Pedrococcus longisetosus* sp. n.—Adult female: *a*, 7-jointed antenna; *b*, 8-jointed antenna; *c*, hind leg; *d*, posterior extremity; *e*, adult female showing arrangement of dorsal conical spines; *f*, ventral cephalic area showing the long and slender setae; *g*, spine from anal lobe; *h*, spine from penultimate marginal group; *i*, spines from cephalic area.

but a marginal series of 15 groups of 1–3 stout conical spines on each side of the body. Dorsal dermis with trilocular pores and sparsely distributed short and stout setae and numerous stout conical spines arranged as in fig. 4, *e*. These spines are situated on faintly sclerotised prominences, especially in the median and marginal series. Each spine is accompanied by 3–5 trilocular pores. Those of the median and marginal series are larger than the others, especially in the abdominal region, and those of the thoracic and cephalic regions vary very much in size. Ventral dermis with trilocular pores, a few large discoid pores in the vulvar region and numerous long and slender setae. These setae are particularly numerous and long on the cephalic and thoracic segments (fig. 4, *f*); those of the frontal area are longer than anywhere else on the venter. Posterior dorsal ostioles with well-developed lips and larger than the anterior dorsal ostioles. Ventral ostiole small, elliptical.

Length, 1·5 mm.; breadth, 0·9 mm.

Material examined.—One adult female (type).

Host and locality.—On an undetermined indigenous orchid. MAURITIUS: Les Mares (2200 ft.), 1934.

Remarks.—This species differs from all the other species of the genus by the more numerous, more slender and longer setae of the ventral dermis.

PRELIMINARY REVISION OF THE GENUS *PARACALOPTENUS* I. BOLIVAR (ORTHOPTERA, ACRIDIDAE)

By B. P. UVAROV, D.Sc., F.R.E.S.
(*British Museum, Natural History*).

History of the genus.

Brunner (1861, 1861a) described under the name *Platyphyma caloptenoides* an insect from the Balkans which he considered quite indistinguishable in the specific characters from *Calliptamus italicus* (L.), while agreeing in the generic ones with *Platyphyma*. At some later date, Brunner must have changed his opinion, since I. Bolivar (1876) has referred to the genus "*Paracaloptenus* Brunner in litt." saying: "Este género lo formo el Sr. Brunner para una especie que primitivamente colocó en el g. *Platyphyma* con el nombre de *caloptenoides*." Since I. Bolivar gave a description of the genus as well as quoted its genotype, he must be considered its author; in fact, he did so himself in 1898. In the meantime, Brunner again changed his view, and in 1882 referred *caloptenoides* to the genus *Caloptenus*, without even mentioning the name *Paracaloptenus*, except in the specific synonyms of *caloptenoides* where he referred to *Paracaloptenus typus* of Bolivar. In 1893, however, Brunner accepted *Paracaloptenus* Bolivar without further comments.

Affinities of the genus.

Although the earlier authors have regarded *Paracaloptenus* as differing from *Calliptamus* only in the reduction of elytra and wings, the two genera are

actually not very closely related. The male cercus in *Paracaloptenus* has a single subapical tooth and agrees in this respect with the genera *Caloptenopsis*, *Sphodromerus*, *Metromerus*, *Acorypha*, *Brachyxenia* and *Peripolus*, while *Calliptamus* is unique in the group Calliptamini in the possession of two subapical cercal teeth, thus showing a definitely higher degree of specialisation.

The genus most closely similar to *Paracaloptenus* is *Peripolus* of northern India, but the similarity is due mainly to the equal degrees of brachypterism in the two genera and does not imply a very close relationship. All other allied genera, enumerated above, consist of fully winged species, except *Sphodromerus*, which includes several species with the elytra considerably reduced, but never completely lateral as they are in *Paracaloptenus*. Moreover, *Sphodromerus* differs from *Paracaloptenus* in the broad and short hind femur and reduced number of posterior tibial spines. *Metromerus* (Uvarov 1936) is probably the nearest relation of *Paracaloptenus*, which differs from it in the completely lateral squamiform elytra; absence of wings; strongly laterally rounded fastigium of vertex; the pronotum widened behind, with lateral carinae practically obsolete, typical sulcus placed well behind the middle and the posterior margin more or less emarginate; females differ, moreover, in the ovipositor, which in *Paracaloptenus* has short and stout valvae, the lower ones being without a lateral tooth, which is well developed in *Metromerus*.

Number of species.

Apart from the originally included *P. caloptenoides*, I. Bolivar (1889) has referred to the genus also *P. obesus* I. Bolivar from Angola. Although this species was described from the female sex alone and not re-examined since, the original description shows that it must be excluded from *Paracaloptenus* on account of the conical prosternal tubercle, posteriorly rounded pronotum and broad hind femur; its generic position cannot be determined until both sexes are known.

The original *P. caloptenoides* was from the Balkan Peninsula and western Anatolia, but I. Bolivar (1876) has identified with it some specimens from north-western Spain, so that the species appeared to exist in two widely separated areas. My re-examination of the available material shows, however, that the Spanish insect is sufficiently distinct from the Balkan one to be regarded as a good species, which is described below. Thus, there are two species in the genus, but material from any new area must be examined very carefully, since the strong brachypterism of *Paracaloptenus* makes probable the existence of narrowly localised species, or, at least, subspecies.

Key to the species.

1 (2). Lateral pronotal carinae more definitely raised; hind margin of pronotum shallowly, but distinctly, excised. Elytra apically rounded, shorter than the length of pronotum, reaching a little beyond the first abdominal tergite.—Balkan Peninsula, W. Anatolia . . . . . *P. caloptenoides* (Brunner).

2 (1). Lateral pronotal carinae very obtuse; hind margin of pronotum rounded-truncate, not excised. Elytra apically angulate, somewhat longer than the length of pronotum, reaching to the apex of the second abdominal tergite.—N.E. Spain, E. Pyrenees . . . *P. bolivari* sp. n.

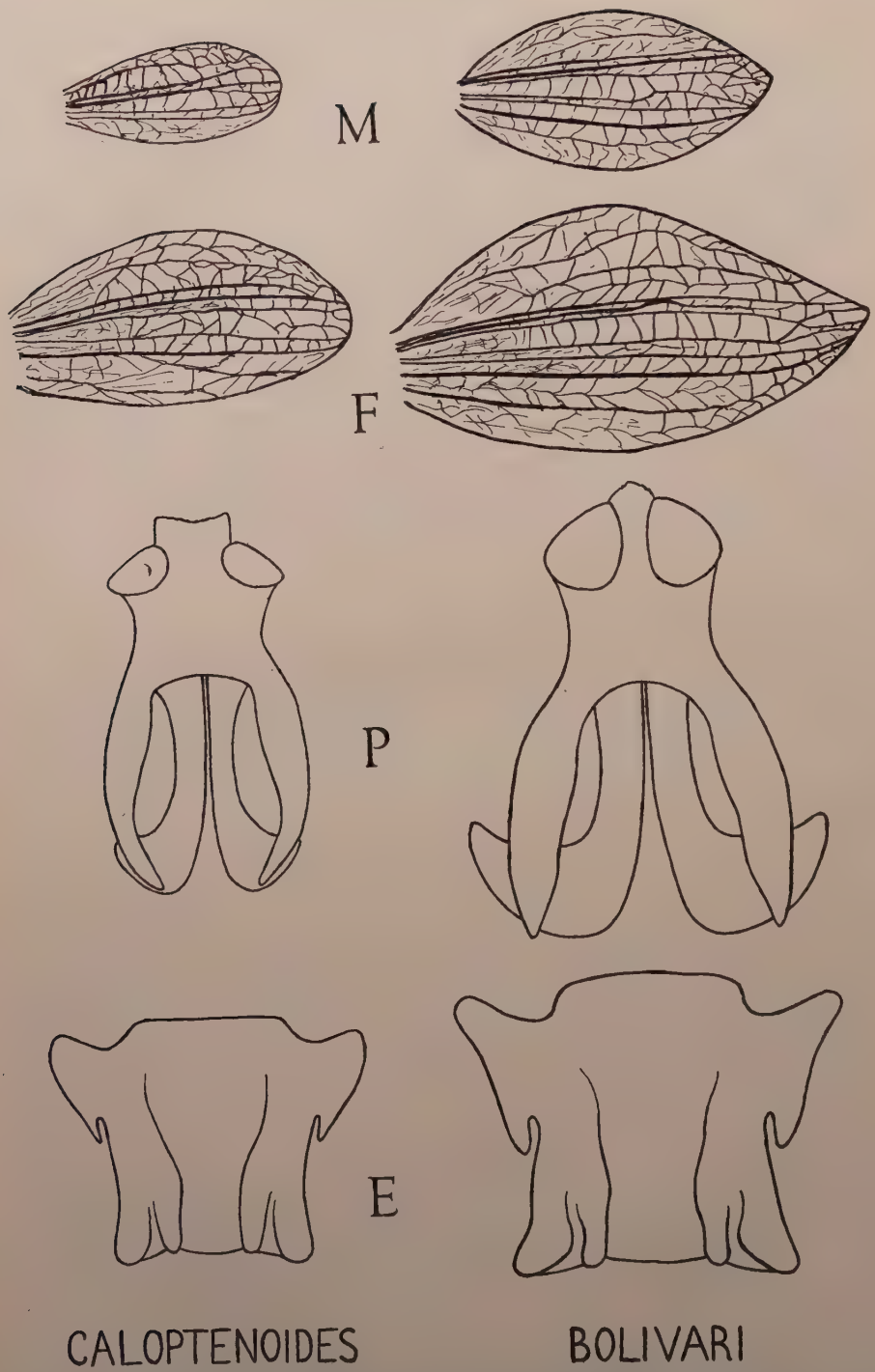

FIG. 1.—*Paracaloptenus caloptenoides* (Brunner) and *P. bolivari* sp. n. M, male elytra; F, female elytra; P, phalli, dorsal view; E, epiphalli, dorsal view.

Comparative measurements of the species.

	P. caloptenoides		*P. bolivari*	
	♂	♀	♂	♀
Total length . .	16	28	17	30
Pronotum . . .	4	6·5	4·1	6
Elytra . . .	3·6	6	4·3	7
Hind femur . .	11	18	—	17

1. *Paracaloptenus caloptenoides* (Brunner 1861).

Platyphyma caloptenoides, Brunner 1861 : 226; *Platyphyma caloptenoides*, Brunner 1861a : 307, pl. 16, figs. 24A, 24B; *Platyphyma caloptenoides*, Frivaldsky 1867 : 174, pl. 7, figs. 4, 4a; *Paracaloptenus typus*, I. Bolivar 1876 : 296 (*partim* !); *Calliptenus Brunneri*, Stål 1876 : 13; *Caloptenus caloptenoides*, Krauss 1879 : 474, pl. 1, figs. 2, 2a; *Caloptenus Brunneri*, Brunner 1882 : 219, pl. VII, figs. 51A, 51B; *Caloptenus Brunneri*, Finot 1889 : 162; *Paracaloptenus caloptenoides* var. *Brunneri*, Martinez 1902 : 301; *Paracaloptenus caloptenoides*, Jacobson and Bianki 1902 : 205, 318; *Paracaloptenus brunneri*, Burr 1910 : 73.

The species has been described and figured by several authors, and a redescription appears unnecessary.

The first description by Brunner (1861) has been overlooked by all subsequent authors, and the second paper by Brunner (1861a) has been usually given as the original reference. I. Bolivar's action (1876) in renaming the species *typus* was probably due to a wish to avoid the cumbersome combination *Paracaloptenus caloptenoides*, which is, however, perfectly valid; his description of the species was partly based on Spanish specimens but mainly on those from Constantinople and I select the latter as the type locality for *typus*. Stål's (1876) *Calliptenus brunneri* was described without reference to Brunner's species, and based on material from Brussa, Western Anatolia. Brunner (1882) adopted the specific name *brunneri* Stål, because, as he said, it "allerdings besser klingt als *Caloptenus caloptenoides*." Martinez (1902) and Jacobson (1902) simultaneously introduced the present correct combination of the generic and the specific name, but the specific description of Martinez was based on Spanish specimens and must be referred to *P. bolivari* (see below), while he regarded *brunneri* as a variety, without apparently knowing it from specimens.

The distribution of *P. caloptenoides* embraces the whole of the Balkan Peninsula, as it is known from Istria, Croatia, Bosnia, Serbia (Belgrade, type locality here selected), S. Hungary, Bulgaria, European Turkey (Istanbul), with outlying and apparently isolated occurrences at Mödling near Vienna and at Kishinev in Bessarabia (Adelung 1906, *Annu. Mus. zool. St. Petersburg*, **10** : i–v). It extends also into western Anatolia (Brussa; Demirchi; Simav; see Uvarov 1934) and occurs on the island of Corfu. The Anatolian specimens appear slightly larger and more slender than the Balkan ones, but more material must be studied to decide whether they might be referred to a distinct subspecies, for which the name *brunneri* Stål would be available. Burr (1910) has recorded *P. caloptenoides* also from Sardinia, but I am unable to trace the source of this record. Jacobson's (1902) record from Syria is also of unknown origin and very doubtful.

2. **Paracaloptenus bolivari** sp. n.

Paracaloptenus typus, I. Bolivar 1876 : 296 (*partim* !); *Paracaloptenus Brunneri*, I. Bolivar 1898 : 87 (*nec* Stål !); *Paracaloptenus caloptenoides*, Martinez 1902 : 301 (*nec* Brunner !).

Closely similar to *P. caloptenoides*, but definitely distinct from it in the characters given in the key above, as well as in some details of the structure of male genitalia shown in the figures. The specimens before me are slightly larger than the average ones of *P. caloptenoides*, but some specimens of the latter are also larger than others, and no importance should be attached to this character.

The type ♂ and a paratype ♀ in the British Museum are from Spain, Eastern Pyrenees, Farga de Moles near Seo de Urgel, 850–1300 m. (*G. F. Meyer*); other paratypes are labelled : St. Hilario, Spain, 1 ♂, 1 ♀; El Run, Huesca, 1 ♀ (*L. Navas*). The species is known also from Barcelona, Collascabra and Cerdaña (Bolivar 1898), and from the French Pyrenees : Canigou and Aude (Chopard 1922).

The distribution area of this species is separated widely from that of *P. caloptenoides* and their specific divergence must be due to this isolation.

The species was recorded from Spain for the first time 65 years ago by Don Ignacio Bolivar and I am very pleased to dedicate it to the oldest and greatest living orthopterist, as a mark of my deep personal respect, and of my admiration for his scientific activity, which commenced nearly seventy years ago and is still continuing.

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THE LINNAEAN NAMES OF INDO-AUSTRALIAN RHOPALOCERA. PART 3

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Since my previous papers on this subject (Corbet, 1941, *Proc. R. ent. Soc. Lond.* (B) **10** : 8–16, 17–27), I have had an opportunity of making a detailed examination of the butterflies in the Linnaean Collection, and for this privilege I am much indebted to the officers of the Linnean Society of London. I found no evidence of the label-changing attributed by many authors to Sir James Edward Smith, M.D., who purchased the Linnaean Collections on the death of Linnaeus' son and subsequently became the first president of the Linnean Society of London. Mr. W. H. T. Tams has examined the labels of all the insects in the Linnaean Collections and has been struck by the absence of more than a single pin-hole due to the original pin in almost all specimens. The fact that the Linnaean type of *Pararge maera* bears a label "Phidippus" in Linnaeus' handwriting and a second label "Maera nec Phidippus" in Smith's writing suggests that Smith was reluctant, at least, to change Linnaean labels. The incorrect labelling of specimens of *Papilio philomela* and *P. lara* mentioned below was undoubtedly effected by Linnaeus himself. Most of the Linnaean types of Cantonese butterflies are low-set on long, black, headless pins and specimens so mounted are marked with an asterisk (*) in what follows; other specimens of undoubted Linnaean origin are mounted on short, common pins with heads.

Specimens in the Collection of Linnaeus.

I stated previously (*loc. cit* : 17) that "it is highly probable that, in every case, the specimens figured in Clerck's *Icones*, Part I (pls. 13–16), and Supplementary Plates 4–8 and 10, were from the Linnaean collection." This has been confirmed, as has the Chinese origin of the specimens. Nothing remains to be said concerning the species figured in the *Icones*, Part I (**agenor*, **assimilis*, **dissimilis*, **helenus*, **pammon*, **paris*, **polytes* and **similis*), except that all are labelled with these names in Linnaeus' handwriting and that *assimilis*, *dissimilis* and *polytes* may not be the identical specimens figured. The specimen of *paris* figured by Clerck is certainly the type (see below).

Regarding the specimens figured in the Supplementary Plates (not all of which are types), **c-aureum*, **chrysippus*, *demoleus* (♀), **hecabe* (♀), *leda*, **midamus* (♂) and **mineus* are all so labelled in Linnaeus' handwriting and are almost certainly the identical specimens figured by Clerck. The specimens of *agamemnon* and **panope* so labelled by Linnaeus may not be the identical specimens figured by Clerck. The specimens of *pasithoe* (a rubbed ♀, not a ♂ as I supposed from Clerck's figure), **almana* (underside different from Clerck's strange illustration of the underside), **perius* and *memnon* agreeing with Clerck's figures have no name-labels by Linnaeus. Of the two Linnaean specimens of *plexippus*, a male on a short pin, with a name-label by Linnaeus with two pin-holes, has a second label "Plexippus 767" by Smith, and a female on the usual "Cantonese" pin has no label. Clerck's figure is a good representation of the male, but a close study suggests that both Linnaean specimens were before the artist. The specimens of *atlites* and **hyperbius* corresponding to Clerck's figures are labelled "*laomedia*" and "*niphe*" respectively in Linnaeus' handwriting. No specimen which could be matched with *aegisthus* was found.

A few of the butterflies call for special remark. The specimen of *leda* mentioned above has the underside exactly as in the top left-hand figure in Clerck, suppl. t. 7, fig. 1, and the fore-wing above has an orange patch as shown in Kershaw, *Butt. Hong Kong*, pl. iii, fig. 3, and it is evidently to this patch that the word "luridus" used by Linnaeus refers. In Linnaeus' own copy of *Editio xii*, "China" is added after the words "Habitat in Asia" referring to *leda*. It seems clear that this specimen must be taken as the type of *leda* and the habitat must be removed from Amboina to South-east China. I thought it questionable if Linnaeus had any specimens from Amboina in his own collection at the time he wrote *Editio x*.

The type of *canace* is labelled "*alimena*" in Linnaeus' handwriting corresponding with this name on Clerck's plate.

A specimen of **hylas* is labelled "*leucothoe*" in Linnaean handwriting, while an example of **perius* corresponding to Clerck, suppl. t. 5, fig. 4 (right-hand), is without a name-label. I have shown already that Linnaeus confused these three names and that the original description of *leucothoë* must be applied to *perius* and not to *hylas*. The unlabelled specimen of *perius* must be regarded as the type of *leucothoë*.

A specimen labelled "*lemonias*" in Linnaeus' handwriting represents the dry-season form and is probably the identical specimen figured by Clerck, suppl. t. 7, fig. 2. Aurivillius found a similar "dry" specimen of this *Precis* species in Queen Ludovica Ulrica's Collection which he regarded as the type of *lemonias*. It appears probable that Linnaeus described both *aonis* and *lemonias* from these two specimens of the dry-season form and omitted the former name from his subsequent works when he realised that they were identical.

Species marked in Linnaeus' copies of *Editio x* and *xii* as being in his own collection and which are not figured in Clerck's *Icones* although specimens have been found in the Linnaean Collection are **pyranthe* and *sarpedon*: both are so labelled in Linnaean handwriting and both agree with specimens from South-east China. As no example of *diomedes* was found, it seems possible that Linnaeus was mistaken in marking it as being in his own collection. It is curious that Aurivillius found no specimen of *diomedes* in the collection of Queen Ludovica Ulrica.

Of the species described by Linnaeus subsequent to the publication of *ditio x* in 1758 and not figured in Clerck's *Icones*, *augias* (♂), *scylla* (♂) and *thrax* (♂) are so labelled in Linnaeus' handwriting. The *augias* specimen is *Telicota krefftii* (W. Macleay) (*vide* Evans, 1934, *Entomologist* **67**: 208), and agrees with an example from Java. The *thrax* is *Erionota thrax* auctt. and not *E. torus* Evans (*vide* Evans, 1941, *Entomologist* **74**: 158), and there is no reason to doubt the Javanese habitat given by Linnaeus. The *scylla* specimen is *Catopsilia scylla* auctt., probably from Java as stated by Linnaeus.

Specimens of *ariadne*, *phidippus* (3 ♂♂) and *hypermnestra* (♂), all agree with Javanese examples and are without Linnaean labels. A male *boeticus* labelled "Boeticus 789 ex Descr." by Smith may also be a Linnaean type.

A specimen of the Lycaenid *lara* so labelled in Linnaeus' handwriting agrees with the original description of *lara* in *Mus. Lud. Ulr.* and with Cramer's illustration of *Papilio jolaus* (*Pap. Exot.* **3**, pl. cclxx, figs. F, G), from the Cape of Good Hope and is undoubtedly Linnaeus' type of *lara*. A second butterfly labelled "*lara*" in Linnaean handwriting agrees in every respect with Roepke's figure in *Rhop. Javanica* **2**, pl. xviii, fig. 7, of *Ypthima philomela*. A specimen of the Palaearctic Satyrid *Coenonympha hero* (L.) in the Linnaean Collection is labelled "*philomelus*" in Linnaeus' handwriting; it cannot be reconciled

with the description of *philomela* in *Cent. Ins. rar.* I believe that Linnaeus himself made these mistakes in labelling, for in his description of *philomela* in *Editio xii* : 768 are the words " Parvus minor Argo, facie Larvae ", the last two words being corrected to " facio P. Larae " in Linnaeus' own copy of *Editio xii*.

No specimens have been found which could be regarded as types of *ascanius*, *argyrius*, *canidia* or *eryx*. As *java* was described in the same paper, it is very doubtful if a male of *Anaphaeis java* (L.) found in the collection without a Linnaean label is the type specimen.

It is worth noting that the species marked by Linnaeus in his own copy of *Editio x* and *xii* to indicate that they were represented in his collection refer only to specimens which bear name-labels in Linnaeus' handwriting.

Specimens in the Linnaean Collection described as being in the Collection of Queen Ludovica Ulrica.

Of the 48 species described by Linnaeus from specimens stated to be in the Museum of Queen Ludovica Ulrica and reported missing therefrom by Aurivillius, 31 have now been found in the Linnaean Collection. The specimens now found in the Linnaean Collection which are undoubtedly the types of the Oriental species concerned are **paris*, **clytia*, **pyrene*, *misippus*, and *nesaea*. Of these, *clytia*, *misippus* and *nesaea* are without Linnaean labels, and the first-named is remarkable for the very faint white inner submarginal lunules on both surfaces of the hind-wing. Other species described in *Mus. Lud. Ulr.* in 1764 and not found in the Queen's Collection by Aurivillius are **agenor*, *agamemnon*, **glaucippe*, *scylla*, **pyranthe*, **hyperbius* (labelled " *niphe* " by Linnaeus), **chrysippus*, **leucothoë*, **assimilis* and **dissimilis*; all of these have been found in the Linnaean Collection and all except *glaucippe* bear a Linnaean name-label. Taking the pinning and setting into consideration, it seems possible that many of these specimens never were in the Queen's Collection and that Linnaeus may have added descriptions of these species in *Mus. Lud. Ulr.* in order to make the work more complete. The only Indo-Australian Rhopalocerous species noted as missing from the Queen's Collection by Aurivillius and not found in the Linnaean Collection are *helena*, *diomedes* and *eurypylus*.

Specimens which are types of Fabrician names.

A few types of oriental species described by Fabricius have been found in the Linnaean Collection. The most important of these is the female holotype of *belladonna* (*vide* Corbet, 1941, *Proc. R. ent. Soc. Lond.* (B) **10** : 103). The specimen is labelled " Belladonna Fab. 4. 180. Figured by Jones from this rariss." in Smith's handwriting; on the underside of the hind-wing, the yellow tornal patch is divided by a black diffuse band, and the specimen is undoubtedly referable to the subspecies *zelima* Mitis from West China. A male of the same species in the collection has the hind-wing yellow tornal area below similarly divided and pertains to the same West Chinese race : it is labelled " M[ar-chioness] of Rock[ingha]m."

Other types in the Linnaean Collection are those of *bernardus* (*Papilio bernardus* Fabricius, 1793, *Ent. Syst.* **3** (1) : 71) labelled " Bernardus Fab. 4. 71. Marsham.-rariss. figd. by Jones from this.", and of *menetho* (*Papilio menetho* Fabricius, 1793, *loc. cit.* : 83), also labelled in Smith's writing " Manetho (*sic*) Fab. 4. 83. rariss. Fabr. described it from Jones's drawing done from this spec."

A female of *Euthalia nais* (Forster, 1771) in the collection under discussion is labelled " Thymelia Fab. p. 142 " by Smith and " Papilio Nymphal[is] Nais N. S. [ ] " (part of the label being torn), and " Phaleratus India orientali " in another handwriting, which may be that of Forster. The specimen agrees with examples from Peninsular India and is probably the nomenclatural type.

Summary.

The Linnaean Collection has been found to contain the typical specimens of *hecabe*, *midamus*, *plexippus*, *chrysippus*, *almana* (n), *similis*, *dissimilis*, *pammon*, *agenor*, *agamemnon*, *mineus*, *leda*, *leucothoë* (n), *assimilis*, *panope*, *sarpedon*, *pyranthe*, *c-aureum*, *aglaja* (labelled " *pasithoe* "), *phidippus* (n), *scylla*, *philomela* (labelled " *lara* "), *canace* (labelled " *alimena* "), *hypermnestra* (n), *ariadne* (n), *atlites* (labelled " *laomedia* "), *hyperbius* (labelled " *niphe* "), *augias*, *boeticus* (n) and *thrax*, all being labelled with the name in Linnaeus' handwriting except those marked (n).

The Linnaeus Collection also contains the types of the following species described as being in the Collection of Queen Ludovica Ulrica but reported as missing by Aurivillius : *paris*, *aonis* or *lemonias* (labelled " *lemonias* "), *pyrene*, *misippus* (n) and *nesaea* (n).

The type specimens of the Fabrician names *belladonna*, *bernardus* and *menetho* have also been found in the Linnaean Collection, the first-named agreeing with examples from West China.

Nomenclatural alterations are necessitated as a result of the habitat of *leda* being moved from Amboina to South-east China, and the discovery that both names *aonis* and *lemonias* refer to the dry-season form of the same species of *Precis*, and it has been shown that the name *augias* must be applied to the species of *Telicota* hitherto known as *Telicota krefftii* (W. Macleay), with habitat Java.

Appendix.

The oldest valid name for the *Telicota* species hitherto known as *augias* appears to be *Papilio colon* Fabricius, 1775. I examined the type specimen of *colon* in the Copenhagen Museum in 1933 and noted that the fore-wing veins were prominently dusted with yellow right up to the distal margin. It is probable that the habitat " India " given by Fabricius refers to South India, so that typical *colon* may be regarded as being confined to Peninsular India. This race is characterised by its very yellow aspect and by the yellow post-discal band always narrowing apically and not being joined with the yellow costal area. For the race which flies from Burma, through Malaysia, to the Philippines, Celebes and Timor the name **Telicota colon vaja** subsp. n. is proposed (♂ holotype Java, Buitenzorg. *Ledru*, 1897, ex Coll. Oberthür). Like all *colon* races other than the South Indian, *vaja* is orange rather than yellow on both surfaces, and typically, on the upperside, the fore-wing post-discal band is broader and joined to the costal orange area. In size, always larger than the Moluccan race *amba* Evans, 1934, and the Australian race *argeus* (Plötz), 1883.

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